

9.0 G&S COMMUNITY CORNER SITE – 6100 ISLETA BLVD. SW NMED Facility Number 6647001

9.1 INTRODUCTION/SITE HISTORY

The Former G&S Community Corner Site (the Site) is located at 6100 Isleta Boulevard SW. Hydrocarbon releases were first discovered in the Site vicinity in October 1988, when elevated hydrocarbon vapor levels were reported in the adjacent US West underground utility corridor. Subsequent installation and sampling of monitor wells identified gasoline hydrocarbon impacts to soils and ground water in the Site vicinity. The site is the current location of Kollar Kar Kare



Former G&S Facility Looking West

operated by Mr. Robert Kollar as an automotive repair facility. The facility is no longer used to dispense fuels.

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA presents the following site summary. In addition, detailed maps were constructed summarizing known Site conditions (Figures 9A, 9B and 9C).

- The Site has been the location of a series of gasoline service stations from the 1950's through 1989 when any remaining USTs were removed from the Site. Reportedly, two sets of USTs were located at the Site (Figure 9A). The more recently operated tanks were located in the southwestern portion of the Site. Based on available site data (presented below) these tanks did not experience major hydrocarbon releases. They were removed from the ground in 1989. The older tank location was located in the northern portion of the Site and appears to have experienced significant hydrocarbon releases (discussed below). These tanks were reportedly removed from the ground in 1984.
- In 1989 and 1990, Mariah and Associates, Inc. (Mariah) and Carson Geologic Services, Inc. (Carson) were retained by the responsible party to install three wells at the Site (MW-1, MW-2, and MW-3). Data collected during their investigations revealed the presence of soil and ground water BTEX contamination centered in the northern portion of the Site.

- During the Carson investigation, 15 private water supply wells were identified within 500 feet of the Site. The majority of these wells are apparently shallow and less than 100 feet deep. Reportedly, several abandoned water supply wells are also located in the same area. An on-site water supply well is located on the property (Figure 9A).
- In early 1992, the NMED placed the G&S Site on its list of state-lead GWPA sites. Ground water Technology, Inc. (GTI) was retained by NMED to complete investigation activities and design and install a remediation system. Between 1992 and 1994, GTI installed and sampled additional monitor wells and soil borings in the Site vicinity. These drilling locations are presented on Figure 9A. During GTI's early investigation activities, TPH laboratory samples were not collected from boreholes advanced at the Site. TPH data from subsequent investigations identified TPH levels at concentrations as high as 31,000 ppm in the vicinity of MW-9.
- Field inspection of the G&S Site by FEI/TPA identified measurement errors on the GTI basemap. These errors have been corrected on Figures 9A and 9C. FEI/TPA also identified at least 6 monitor and/or remediation wells, which were not identified on any of the maps we reviewed in the NMED case file. Three of these wells (located east of the Site building) appear to be part of the GTI remediation injection well gallery. Three other wells labeled as MW-A through MW-C on Figure 9A and 9C appear to be located along the piping runs for the remediation system and may be unreported remediation wells.
- Using the GTI borehole data, FEI/TPA constructed the two cross sections shown in Figure 9B. Analyses of these data provide useful insight into contaminant fate and transport mechanisms at the Site. Four primary lithologic units appear to be present in the upper 20 feet of sediments at the Site. Lithologic Unit I extends from the land surface to approximately 3 to 7 feet below ground surface (bgs) and is composed of silty sand with localized fill units near the land surface. Lithologic Unit II is composed of fine-grained sands, which extend from the base of Lithologic Unit I to depths of up to 11 feet bgs. Lithologic Unit III is reportedly composed of low permeability clay-rich sediments. This Unit was encountered in all wells and borings advanced at the Site and appears to be approximately 5 to 7 feet in thickness based on data obtained during drilling of MW-9 (deep). Lithologic Unit III has apparently acted as a barrier to vertical contaminant migration at the Site. Lithologic Unit IV underlies Lithologic Unit III at the location of MW-9 (deep) and is composed of well-sorted sand.
- Depth to static ground water at the Site has been measured to be approximately 7 to 8 feet bgs. Calculated shallow ground water flow is to the west-southwest at a gradient of approximately 0.002 to 0.001 feet/foot.
- The most important hydrogeologic feature identified at the Site appears to be the contact between Lithologic Units III and IV and its relationship with the static water table. This lithologic contact appears to undulate across the site, varying in depth by as much as 4 feet. Primary contaminant migration appears to be along the above referenced contact through Lithologic Unit II. Examination

of cross section A-A' and B-B' suggests the presence of a "bowl-shaped" area of coarse-grained Lithologic Unit II sediments that extend several feet below the water table in the immediate vicinity of the former northern tank pit. The majority of contamination in the Site vicinity appears to have been concentrated in this zone prior to remedial efforts. The presence of low permeability clay-rich Lithologic Unit III sediments extending "above" the water table in select areas may have acted as a partial barrier to horizontal contamination migration at the Site.

- The approximate extent of soil hydrocarbon contamination prior to remedial efforts is shown in Figures 9B and 9C. TPH soil contamination was concentrated in the general vicinity of the northwestern portion of the Site. Analysis of laboratory chromatograms suggests gasoline contaminants at the Site were weathered in nature. A larger vapor-phase hydrocarbon halo surrounded the TPH contamination core. Phase Separated Hydrocarbon (PSH) has been measured at varying amounts in wells MW-2, MW-3, and MW-4 since initial discovery of the releases. A moderate-sized dissolved-phase ground water BTEX plume was documented at the Site prior to remedial efforts.
- In April 1994, GTI conducted a multi-phase vacuum extraction (MPVE) pilot test at the Site using well ASVP (Figure 9C). Based on their test, GTI calculated an effective radius of influence of approximately 38 feet. Our analysis of pilot test data suggest a smaller effective zone of vacuum influence (EZVI) of approximately 20 to 25 feet. Substantial pressure drops documented between applied vacuum measured at the blower and applied vacuum measured at the ASVP well head (~50%) suggest some type of problem with the piping or the well construction during the pilot test. Maximum flow was approximately 40 standard cubic feet per minute (scfm) and maximum applied vacuum measured at the wellhead was 4.5" Hg. Recovered vapor samples sent for laboratory analysis contained between 2,100 and 2,600 ppm/v TPH.
- An in-situ MPVE reclamation system was installed at the Site in 1995 consisting of six 2" diameter schedule 40 PVC wells manifolded via underground 3" diameter schedule 40 PVC piping to a liquid-ring vacuum pump, liquid-phase GAC treatment canisters, an oil-water separator, and a 250 scfm catalytic oxidizer. Treated vapors were discharged to the atmosphere and treated ground water was re-injected to ground water via an infiltration gallery located to the southeast of the on-site building. The system operated between August 1995 and April 1996. High levels of hydrocarbon vapors recovered during initial system operation resulted in catalyst thermal failure. Subsequent modification of the remediation system and well operating configurations prevented this occurrence during the remaining operational period.



PSH in MW-4 During July 1999

- Hydrocarbon recovery from the Site during the period of operation is not well documented and is based predominantly on PID readings. During the final quarter of system operation, GTI calculated the system physically removed only 28 pounds of hydrocarbons.
- During our recent site inspection, approximately 1/8" of PSH was identified (see previous photograph) in downgradient monitor well MW-4 (Figure 9C). The most recent ground water sampling of select monitor wells at the Site documented significant reductions in BTEX concentrations in monitor wells MW-3, ASVP, and MW-10. However, this may be the result of having sampled former remediation wells as opposed to strictly monitoring wells. During the November, 1997 sampling event, PSH was documented in monitor wells MW-2 and MW-4. Current dissolved-phase ground water quality at the Site is unknown.
- The current condition of the subgrade treatment system and reinjection gallery is unknown. The oxidizer was not observed at the Site during our Site inspection in July of 1999. The catalytic oxidizer has been removed from the Site along with all aboveground controls. The liquid-ring vacuum pump was sitting in the backlot of the property (see photograph) and appeared to need maintenance and repair. The electrical service at the Site needs to be modified to meet current building code standards.



installed in the vicinity of the release at locations between remediation wells to provide more accurate ground water quality data for the Site. These borings should be continuously sampled for lithology and analyzed for soil TPH and BTEX as well.

9.2 EXISTING SITE CONDITIONS

Based on the above data, the following deficiencies need to be addressed:

- At present, only one monitor well appears present on-site, which has not been manifolded into the remediation system. Monitor wells need to be installed in the vicinity of the release at locations between remediation wells to provide more accurate ground water quality data for the Site. These borings should be continuously sampled for lithology and analyzed for soil TPH and BTEX as well.
- The presence of persistent PSH in monitor wells MW-2 and MW-4 needs to be more fully evaluated. The western extent of ground water hydrocarbon impacts has not been characterized and is of critical concern to nearby downgradient water supply wells. Understanding the subsurface topography of the Lithologic Unit II/III contact is critical in evaluating potential for further off-site migration of hydrocarbons and potential threats to nearby off-site private water supply wells.

- The initial pilot test at the Site did not fully characterize subsurface conditions and treatment well efficiency. No monitoring points were located within 25 feet of the pilot test well. Furthermore, initial vapor concentrations were underestimated.
- The existing remedial system should be tested to evaluate radii of influence, off-gas concentrations, and operational status. Screened intervals in each of the treatment/monitor wells should also be evaluated as well screens do not fully penetrate the vadose zone impacted soil column and extend up to five feet below the base of the hydrocarbon impacted soil column (Figure 9B). It is likely that screening of these wells higher in the soil column would have resulted in greater well efficiency. Upgrade and operation of the existing reclamation system will likely be required to mitigate PSH and source area hydrocarbons.

9.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct an Additional Three Quarterly Sampling Rounds

Ground water in all usable wells (eighteen existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of ground water sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuation indicators. We propose sampling 10 wells in the second, third and fourth quarters.

During each sampling event, ground water levels will be measured prior to sampling. Collected data will be used to define drilling locations as needed in Task Three below. New locks and well caps will be installed on each usable well. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Hydrogeologic Investigation

General – FEI/TPA will characterize the magnitude and extent of soil and ground water contamination in the Site vicinity through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 9C. Off-site access will be required for several drilling locations. For the

purposes of cost estimation and based on a comprehensive review of the Site data we propose the following number of soil borings and wells:

Projected Drilling Activity

- 5 - Soil borings
- 4 - 2" diameter shallow completion monitor wells
- 5 - 4" diameter Multi-Use Monitor/VE wells w/high flow screen (*see below*)
- 3 - 1" diameter multiple completion pilot test wells (*see below*)

All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5 foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. Two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline-range) using EPA method 8015 modified and for BTEX and MTBE using EPA method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

We recommend conducting a VE pilot test to evaluate the current condition of the existing remedial system and the potential for expansion and upgrade. To minimize mobilization costs and maximize soil and ground water data collection, we propose that several of the proposed drilling locations be completed as multi-use 4" diameter wells or 1" diameter pilot test well clusters. Pilot testing will be conducted on the existing MPVE remedial system and at one of the newly installed high performance 4" diameter pilot test wells. Based on our current understanding of the Site, air sparging would have only limited applications.

Aquifer Hydraulic Properties - Pursuant to the requirements of the USTR Part XII, Section 1210, FEI/TPA recommend evaluation of Site hydrogeologic properties through laboratory testing of retrieved sediment samples. Data collected from these activities will be used to determine grain size distribution, grain and bulk density, specific permeability (k) and effective porosity (n). Hydraulic properties such as storativity, transmissivity (T), and hydraulic conductivity (K) can then be estimated using sediment sample data. This information will then be used to calculate average ground water and contaminant migration rates, which are necessary in risk assessment calculations and/or determination of potential remedial alternatives. We recommend two monitor well locations to collect discrete sediment samples for laboratory characterization. Two samples will be collected from each location; one in the vadose zone, one in the shallow saturated zone. In addition to the above, two of the samples will also be analyzed for total organic carbon content (TOC).

We also recommend biological characterization of select retrieved soil samples for plate count analysis of total microbial populations and total hydrocarbon degrading populations in a laboratory setting. One sample will be collected from the vadose zone and one from the phreatic zone. These data will provide useful information regarding the potential for enhanced biodegradation of hydrocarbons at the Site.

Task Four - Completion of the Hydrogeologic Investigation (HI) Report

Upon receipt of all field data, FEI/TPA will prepare a summary HI report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as they relate to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

Task Five - Conduct VE Pilot Test and Evaluate Portions of the Remediation System. (Optional)

We recommend evaluation of the current condition of the MPVE system, which has been abandoned in place for over three years. The condition of subgrade piping and the condition of treatment wells should be evaluated. We also recommend evaluation of the efficiency of current 2" diameter wells compared with proposed high performance 4" diameter wells. In conjunction with engineering evaluation of the system we also recommend the implementation of a short-term MPVE pilot test to better evaluate remedial alternatives, well spacing/zone(s) of influence, process water generation vs. applied vacuum, flow and vacuum responses, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in determining the best remedial approach for the Site, which will likely involve upgrade and expansion of the existing remedial system.

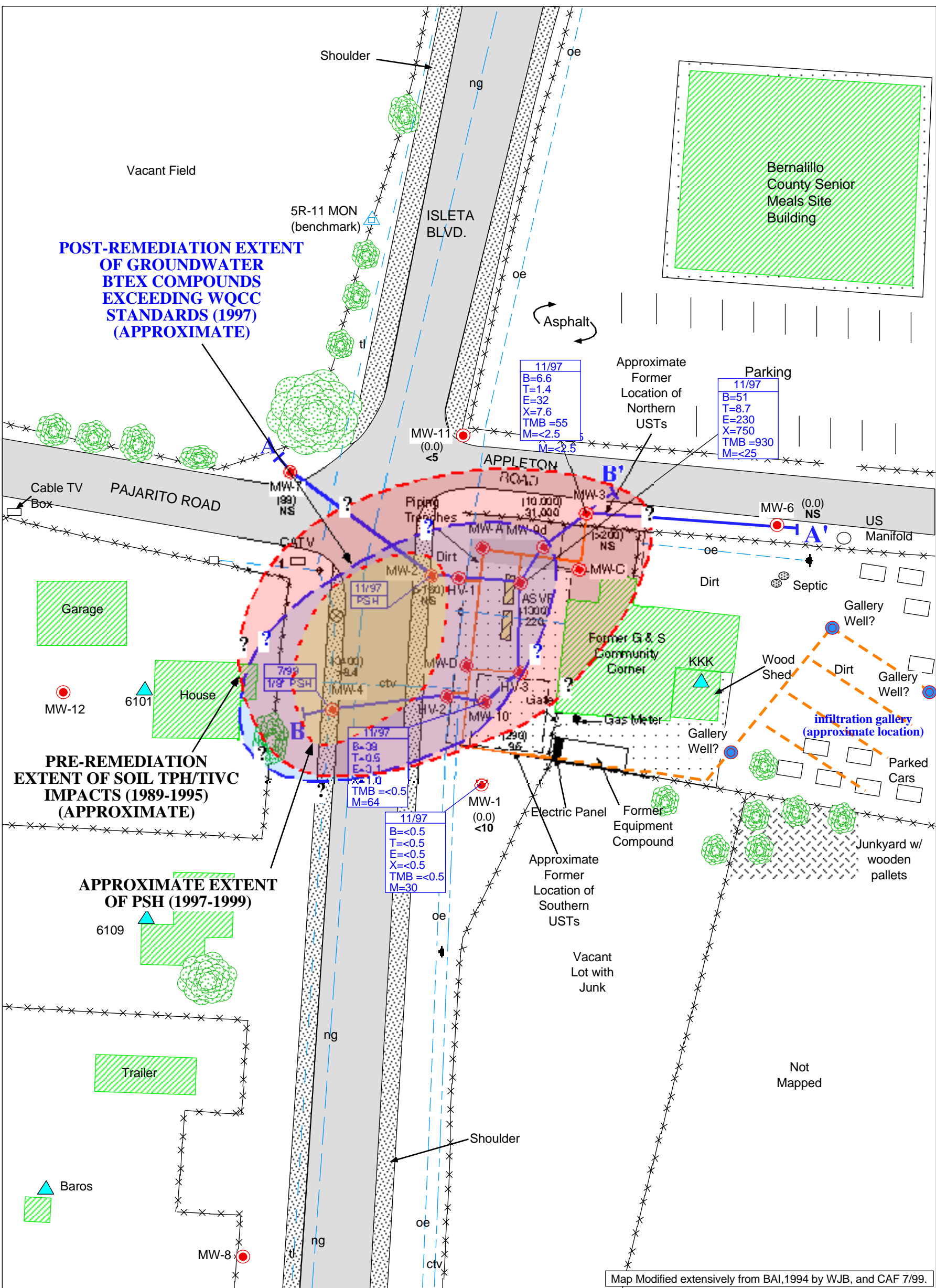
Due to the many site complexities, the pilot test will be conducted in two primary phases over a two-day period. Phase One will consist of in-situ VE testing on previously installed 2" diameter wells. A blower will be connected to the primary manifold in the former equipment compound. Each of the six existing treatment wells will be tested for an approximate one-hour period to evaluate potential piping breaks, leaks, etc. and off-gas emission concentrations. Following this phase of testing, well HV-1 will be operated for a period of approximately 4 hours. Initially, vacuum and flow will be increased in step fashion to evaluate optimal conditions and determine the breakthrough point for two-phase flow from the well. Once optimal flow conditions have been evaluated, applied vacuum and flow will be maintained for the duration of the test. Using newly installed monitor wells and combination vadose/phreatic zone 1" diameter vacuum monitoring well clusters, will allow measurement of vacuum responses on a three dimensional basis during each portion of the pilot test. A PID and an explosimeter/oxygen meter will be used to field screen vapor emissions from the wells. Four vapor samples will also be collected in tedlar bags during the first day and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. In addition, two samples will also be analyzed for fixed gases and methane using standard EPA methodology.

Phase Two will consist of in-situ VE testing in newly installed high performance 4" diameter wells, VM-

2 and VM-3 (see above). In an effort to evaluate the effects of lithologic heterogeneity across the Site and potential EZVI beneath Isleta Boulevard, day two pilot testing will be conducted at two separate locations. Phase Two testing will also evaluate the effectiveness of larger diameter, more efficient treatment wells at the Site and focus on off-site VE effectiveness in the vicinity of monitor well, MW-4 (contains PSH). Initially, vacuum and flow will be applied in VM-2 (Figure 9C). As presented above, vacuum and flow will be applied in a step-wise fashion to identify the most efficient operating configuration vs. water generation. VE testing will be conducted on VM-2 for an approximate 4-hour period. This test will allow direct comparison of the high performance 4" diameter wells with earlier installed 2" diameter wells.

The second half of day two testing will involve VE testing of off-site well VM-3 in the vicinity of monitor well MW-4. This well will be tested in the same manner as VM-2.

A PID and an explosimeter/oxygen meter will be used to field screen vapor emissions from the wells. Four vapor samples will also be collected in tedlar bags during day two and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. Using proposed monitor wells in conjunction with strategically placed vadose/phreatic zone 1" diameter monitoring well clusters will allow measurement of vacuum in a three dimensional nature during each portion of the pilot test.



Map Modified extensively from BAI, 1994 by WJB, and CAF 7/99.

Explanation:

- Present Monitor Well Location
(711) ← PID Reading (in ppm/v)
6600 ← TPH as gasoline

■ Building

■ Asphalt

■ Concrete

×× Fence

● Vegetation

▲ Private Water Supply Well
- oe Overhead Electric

tl Telephone Line

ng Natural Gas

ctv Cable T.V. Line

B — B' Location of Cross Section
- Power Pole

Overhead Electric

Telephone Line

Natural Gas

Cable T.V. Line

Location of Cross Section
- | Sampling Date |
|---|
| B=Benzene |
| T=Toluene |
| E=Ethyl Benzene |
| X=Total Xylenes |
| TMB=Tri-methyl Benzene |
| M=(MTBE) Methyl-Tertiary Butyl Ether |
| All concentrations in Parts Per Billion (ppb) |

0 20 40ft

Scale 1"=40'

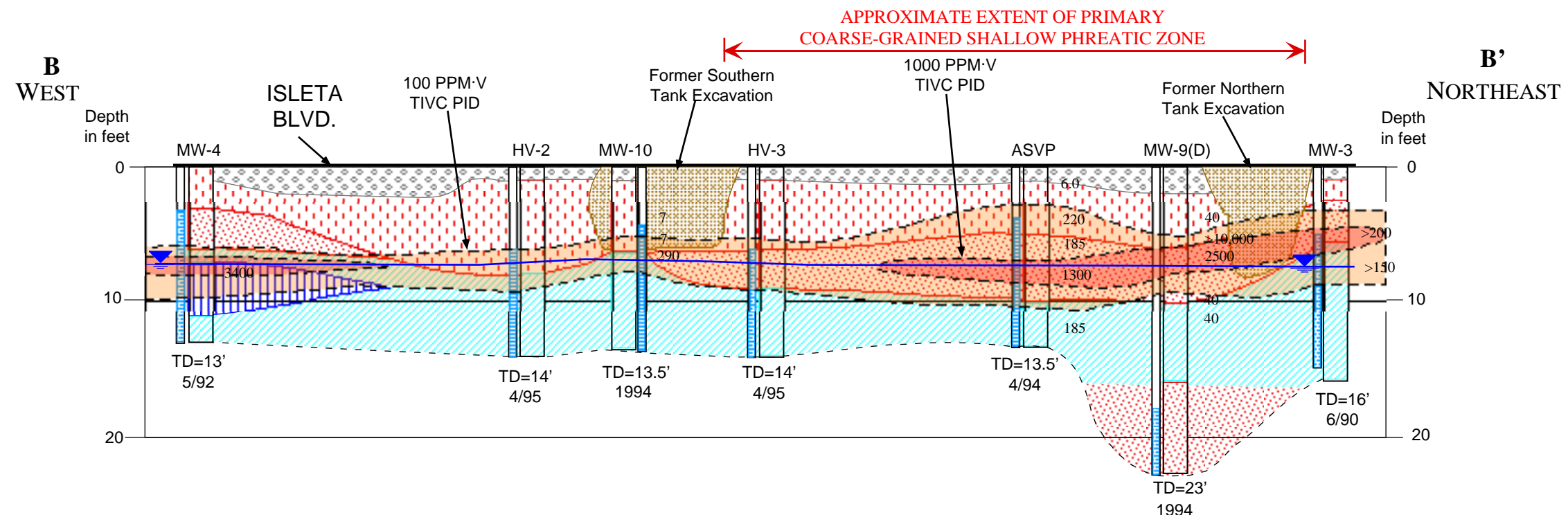
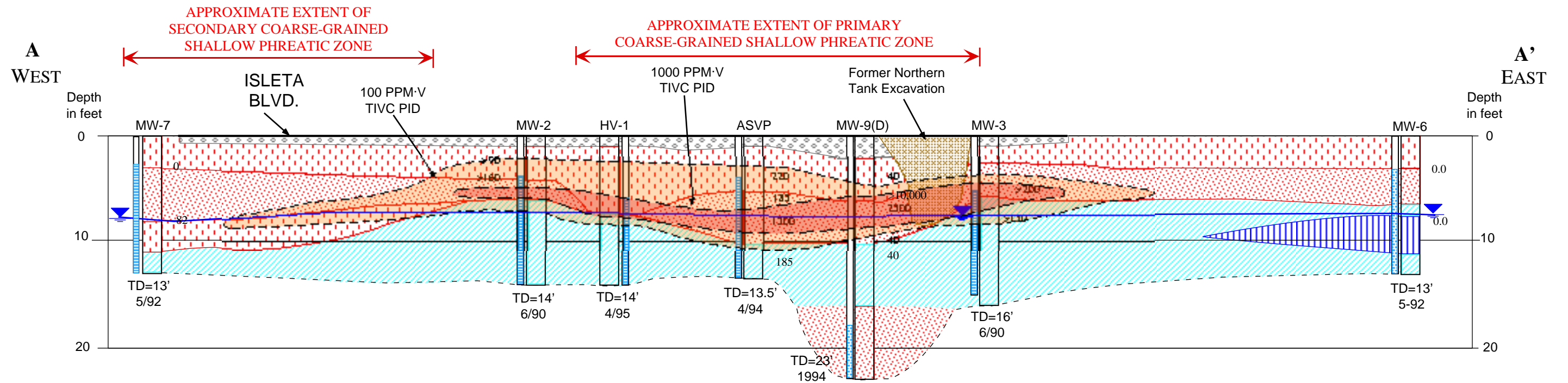
Soil and Groundwater Quality Summary Map

Former G & S Community Corner Site
6100 Isleta Blvd. SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.

TECUMSEH PROFESSIONAL ASSOCIATES, INC.

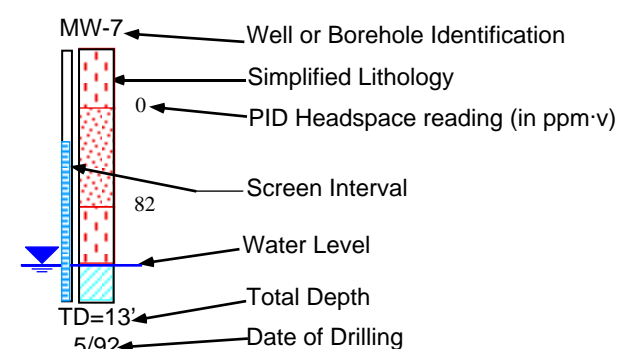
Drawn by:	WJB/CAF	7/99	Client: BCEHD
Drafted by:	ABL	7/99	Job # 035-001
Approved by:	WJB	8/99	Figure: 9A



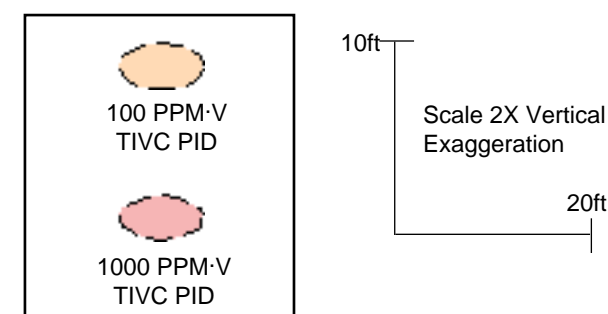
EXPLANATION:

Lithology			
SM	Well sorted sands	ML	Silt, clayey or sandy (low clay content)
SP	Well sorted sands	CL	Clay (high clay content)
	Fill Material/Asphalt		
	Excavation Fill		

ORIGINAL BOREHOLE DATA FROM GTI, 1992-1996 AND CGS, 1990)



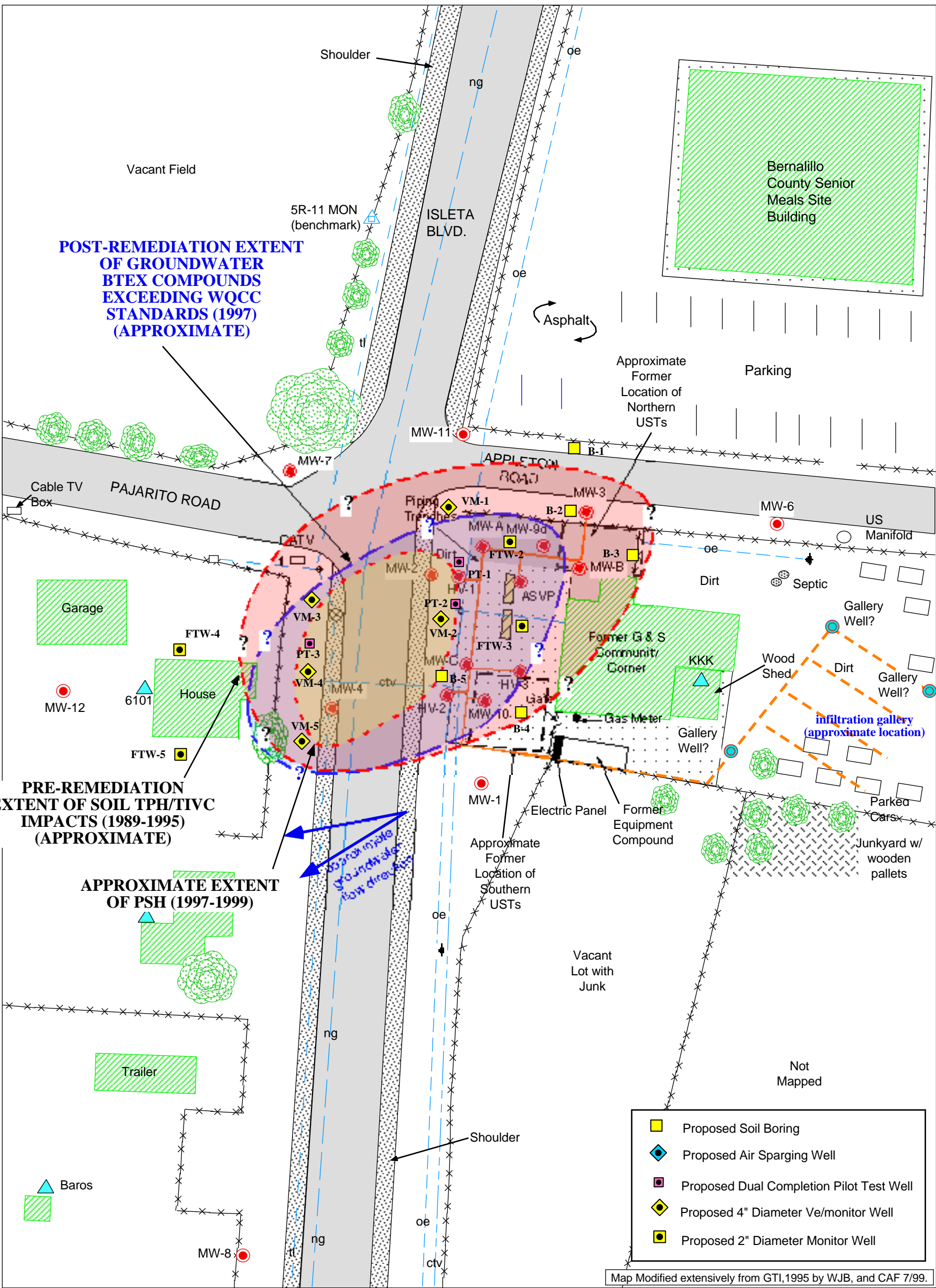
This Cross Section is an interpretation of available data. Some variations may be expected from actual site conditions.



Simplified Geologic and Contaminant Cross Section

A-A' and B-B'
G & S Community Corner

FEI FAITH ENGINEERING, INC.				TECUMSEH PROFESSIONAL ASSOCIATES, INC.	
Drawn by:	WJB	8/99	Client:	BCEHD	
Drafted by:	ABL	8/99	Job #	035-001	
Approved by:	WJB	8/99	Figure:	9B	



Map Modified extensively from GTI, 1995 by WJB, and CAF 7/99.

Explanation:

- Present Monitor Well Location (711)
 - PID Reading (in ppm/v)
 - TPH as gasoline
 - Building
 - Asphalt
 - Concrete
 - Fence
 - Vegetation
 - Private Water Supply Well
 - Power Pole
 - Overhead Electric
 - Telephone Line
 - Natural Gas
 - Cable T.V. Line
 - Location of Cross Section
- Sampling Date
- B=Benzene
T=Toluene
E=Ethyl Benzene
X=Total Xylenes
TMB=Tri-methyl Benzene
M=(MTBE) Methyl-Tertiary Butyl Ether
All concentrations in Parts Per Billion (ppb)
- Scale 1"=40'

Proposed Drilling and Pilot Test Locations

Former G & S Community Corner Site
6100 Isleta Blvd. SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.

TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

Drawn by:	WJB/CAF	7/99	Client: BCEHD
Drafted by:	ABL	7/99	Job # 035-001
Approved by:	WJB	8/99	Figure: 9C

12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: G&S Community		Site Address: 6100 Isleta SW Albuquerque, NM 87105	
Circle only one:	Circle only one:	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
<input checked="" type="checkbox"/> Work plan <input type="checkbox"/> Claim	<input type="checkbox"/> Phase 1 — Hydrogeo Investigation	<input type="checkbox"/> Phase 3 — Reclamation Proposal	<input type="checkbox"/> Phase 5 — Operations and Maintenance
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$33,600.00		
TAXABLE EXPENSES	\$5,877.75		
TAXABLE SUBCONTRACTORS	\$19,460.70		
TAXABLE SUBTOTAL	\$58,938.45		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$3,278.45		
TOTAL	\$62,216.90		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$62,216.90		

12/1/95•BJWR

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: G&S Community**Site Address:** 6100 Isleta SW
Albuquerque, NM 87105**Circle only one:****Work plan** **Claim****Circle only one:**

Minimum Site Assessment

Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
Initial sampling + 8 qtrs gw monitoring					\$12,200.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$7,860.00		
Hydrogeologic Report					\$8,420.00		
Pilot Testing					\$5,120.00		
SUBTOTAL					\$33,600.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: G&S Community

Site Address: 6100 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ **Work plan** ☐ **Claim**

Circle only one:

Minimum Site Assessment

☒ Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
Initial sampling + 8 qtrs gw monitoring					\$2,312.00		
Drilling & Sampling (Hydrogeologic Investigation					\$2,023.00		
Hydrogeologic Report					\$557.00		
Pilot Testing					\$985.75		
TAXABLE SUBTOTAL					\$5,877.75		

